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the upper bracts almost three times larger, free or slightly connate at base, oblong-quadrate, one-third bilobed, rarely trifid, segments subacuminate, acute, bractioles smaller, entire or bifid at apex, provided on both sides near the base with one to three large teeth; perianth highly exserted, seven times larger than the stem leaves, clavate or linear-fusiform, deeply trigonous, mouth constricted, often scariose, afterwards lacerate and erose, fleshy, five to eight cells thick near the base, cells large elongate, pellucid; calyptra pyriform, delicate, of a purple-brown color like the spores and elaters; androecia?

Habitat; damp earth in alpine localities.

Its nearest allies are *Hygrobiella* and *Anthelia*, from both of which it principally differs in having all branches lateral, with a difform leaf subtending the branch and in having very concave leaves with connivent lobes.

Highlands, New Jersey.

MOSS FLORA OF THE NORTH SHORE OF LAKE SUPERIOR IN MINNESOTA.

JOHN M. HOLZINGER.

ITINERARY.—In July and August, 1902, the writer in company with Prof. Bruce Fink and Mr. H. Hibbard, made a botanical exploration of the north shore of Lake Superior, under the auspices of the Minnesota Botanical Survey, and this paper enumerates the mosses of that expedition collected by the writer.

The party pitched tent in the outskirts of the village of Grand Marais, and whenever longer tours were not possible the vicinity of that village was carefully explored, the labels for the plants thus collected bearing date of July 15 to August 7, the date of breaking camp to proceed to Grand Portage. The longer collecting trips from Grand Marais camp are as follows:

1.—July 19 along the Little Devil's Track trail, over rough wooded and bushy country, to a point some five miles from the village.

2.—July 20, along the so-called Old Iron trail, at this time not in use and obliterated by young tree growth so that it was necessary for the party to blaze a path through this stretch of rather continuous dense forest growth, making progress slow. The farthest point reached on this trip was not quite three miles from camp.

3.—July 28, to Rosebush Falls, a point about three miles west, close to the Lake shore. The trail here was easy and open leading for a considerable stretch over granitic "roches moutonnées" interspersed with stretches of

forest and swamp. Rosebush Falls proved a most satisfactory collecting ground, as the many fine things reported from here attest. The creek which here falls over a perpendicular ledge of some twenty feet, close to the Lake shore, was followed up for about one-half mile.

4.—July 31, the trip along the Gunflint trail to the large swamp about ten miles north of the camp. This yielded especially fine *Sphagna*.

5.—August 5, a trip along the mail trail to Two Harbor, to a point about three miles beyond Rosebush creek.

6.—August 11, 12, two exploring trips over Grand Portage Island, comprising about seventy acres of rocky and wooded territory, an area with a very rich and varied moss flora. The party had meanwhile been conveyed by steamer to Grand Portage Island, and by permission of its owner, Pete Gagnon, had pitched camp on the north side of it.

7.—August 13, a trip to the mainland to the east of the island, thence following the trail to the base of Mount Josephine, 1,328 feet alt. (i. e. above sea level) about a mile inland. The mountain was ascended from the west side without difficulty, though in places the ascent was quite steep.

8.—August 14, another trip to the mainland, and to the base of Mount Josephine, resulted in striking a very rich moss flora, including *Sphagna*, principally on the edge of a small lake or pond without outlet, bordered all around by a sphagnum bog.

9.—August 15, the last trip, at least of the writer, on this expedition, to Hat Point, the bold rocky wood covered peninsula projecting southward for several miles into Lake Superior from Mount Josephine. The region is indescribably rugged, being extensively covered by gigantic jagged fragments the size of houses, the interstices between which are frequently bridged over by huge cushions of moss, and the shaded sides of which are covered with great colonies of lichens. This proved to be one of the richest collecting grounds visited on this expedition.

The material gathered from the several localities above named yielded two hundred and thirty-one species, varieties and forms, one hundred and forty-five, given herewith, have not before been reported from Minnesota. Several are new to North America. Specimens of all species, etc. from all stations are deposited in the Herbarium at the University of Minnesota.

ACKNOWLEDGEMENTS —The following persons have aided in determining groups of mosses for this report: Dr. A. J. Grout has named principally the species of *Eurhynchium* and *Brachythecium*; Dr. G. N. Best principally species of *Leskea*, *Thuidium* and *Orthotrichum*; Messieurs Cardot and

Thériot have named species of Mnium, Bryum and especially Hypnum, this last a very voluminous task; M. F. Renauld has named the Harpidia; Dr. Bryhn, principally Dicrana and Amblystegia; Dr. Julius Roell, the Sphagna. It has seemed desirable to give credit to these gentlemen also under the species that were determined them, as well as to two others to whom belongs the credit of naming individual species. To all of these persons grateful acknowledgement is herewith expressed.

Following is the list of species and varieties new to the state, new species or species new to North America being printed in caps and small caps. Since the list was made out the species starred have been found in other localities and are therefore not now new to Minnesota.

- Amblystegium fluviatile* (Sw.) B. & S.
 AMBLYSTEGIUM HYGROPHILUM (Jur.)
 B. & S. forma OBSOLETINERVIS
 Card & Thér.
Amblystegium Juratzkanum B. & S.
 " *serpens pinnatum* B. & S.
Amphidium Mougeotii (B. & S.) Sch.
Andreaea petrophila Ehrh.
Bartramia pomiformis crispa B.
 & S.
Blindia acuta (Dicks.) B. & S.
Brachythecium glareosum (Br.) B.
 & S.
Brachythecium Novae - Angliae
 (Sull. & Lesq.) Jaeg. forma.
Brachythecium plumosum homomallum B. & S.
Brachythecium populeum (Hedw.)
 B. & S.
Brachythecium reflexum (Stark) B.
 & S.
Bryum bimum Schreb.
 " *capillare* L.
 " *cirratum* Hoppe & Hornsch.
 " *cuspidatum* Sch.
 BRYUM ELEGANS FERCHELII (Funck)
 Breidl.
 BRYUM GRAEFIANUM Schlieph.
- Bryum inclinatum* (Sw.) B. & S.
 forma.
Bryum intermedium Brid.
 BRYUM MILDEANUM Jur.
Bryum pallens Sw.
 " *pallescent* Schwaegr.
 " *pendulum* (Hornsch.) Sch.
 *BRYUM PSEUDOTRIQUETRUM COMPACTUM Sch.
Campylium Sommerfeltii (Myr.)
 Bryhn.
Catharinaea angustata Brid.
Cynodontium schisti (Oed.) Lindb.
 " *polycarpum strumiferum* (W. & M.) Sch.
 CYNODONTIUM STRUMIFERUM SCABRIUS
 Hag.
Dichelyma falcatum (Hedw.) Myr.
Dichodontium pellucidum (L.) Sch.
Dicranella cerviculata (Hedw.) Sch.
Dicranum Bergeri Bland. — *D. Schraderi* Schwaegr.
 DICRANUM BERGERI RUPINCOLA Kindb.
Dicranum fragilifolium Lindb.
 DICRANUM LONGIFOLIUM HAMATUM Jur.
 * " " SUBALPINUM Milde.
 * " SCOPARIUM ORTHOPHYLLUM Brid.
 " *strictum* Schleich.

- Distichium inclinatum* (Ehrh.) B. & S. *Hypnum revolutum* Mitt.
Ditrichum flexicaule (Schwaegr.) Hpe. " *Renauldi* Kindb.
Ditrichum flexicaule (Schraegr.) Hpe. forma *luxurians*. " *Richardsoni* (Mitt.) L. & J.
Encalypta vulgaris Hedw. " *stellatum* Schreb.
Eurhynchium diversifolium B. & S. " *uncinatum plumosum* Sch.
Grimmia ovata W. & M. " " *plumulosum* B. & S.
Hypnum aduncum polycarpon Bl. *Hypnum uncinatum plumulosum* B. & S., forma *gracilescens* = *Hypnum contiguum* Nees.
" " " " *Hypnum uncinatum subjulaceum* B. & S.
" " " " *Leskea Wollei* Aust. = *Leskea cyrtophylla* Kindb.
Hypnum aduncum attenuatum Boul. *Leskea nervosa* (Schwaegr.) Myr.
" forma *amblystegioides depauperata* Ren. " " *flagellifera* Kindb.
Hypnum alpestre Sw. " *tectorum* (L. Br.) Lindb.
" *arcuatum* Lindb. *Leucodon brachypus* Brid.
" *chrysophyllum brevifolium* Ren. & Card. *Meesia tristicha* (Funk) B. & S.
Hypnum cordifolium Hedw. *Mnium affine* Bland.
" *cupressiforme* L. " *cinclidioides* Blytt.
" *curvifolium* Hedw. forma ad *Hypnum arcuatum accedens* fide Thérôt. " *Drummondii* B. & S.
" " " " *hymenophylloides* Huebn. forma *densa*.
Hypnum dilatatum Wils. *Mnium orthorrhynchum* B. & S.
" *fertile* Sendth. " *punctatum elatum* Sch.
" " " " *subglobosum* B. & S.
HYPNUM FLUITANS JEANBERNATI Ren. *Oncophorus virens* Brid.
passant au forma TENELLA Ren. " *Wahlenbergii* Brid.
Hypnum imponens Hedw. *Oreoweisia serrulata* (Funk) Sch.
" *ochraceum* Turn. *Orthotrichum fastigiatum* Bruch.
" " *flaccidum* Milde. " *obtusifolium* Schrad.
" *palustre* L. " *praemorsum* Vent.
" " " var. *gracilius* Ren. " *rupestre* Schleich.
HYPNUM PALUSTRE JULACEUM Sch. *Philonotis fontana caespitosa* (Wils.) Sch.
" " SUBSPHAERICARPON (Schleich.) B. & S. PHILONOTIS MARCHICA LAXIRETIS Card. & Thér.
HYPNUM PALUSTRE var. á peu près HYPNUM INTERTEXTUM Voit., fide Renauld. *Pogonatum alpinum arcticum* (Sw.) Brid.

Polytrichum Ohioense Ren. & Card.
" *strictum* Banks.

Plagiothecium denticulatum laetum
Aust. — *Plagiothecium passai-*
cense Aust.

Plagiothecium elegans (Hook.) Sch.
forma.

PLAGIOTHECIUM ELEGANS NANUM (Jur.)
Walth. & Mol.

Plagiothecium roeseanum (Hpe.) B.
& S.

*PLAGIOTHECIUM RUTHEI Limpr.

Plagiothecium turfaceum (Lindb.)
Sch.

PYLAISIA POLYANTHA BREVIFOLIA
(Lindb. & Arn.) Par.

Pylaisia polyantha Jamesii (Sulliv.)
E. G. Britton.

Palaisia Schimperi Card.

" *subdenticulata* B. & S.

Rhabdoweissa fugax (Hedw.) B. & S

Rhacomitrum aciculara (L.) Brid.

" *fasciculare* (Schrad.)
Brid.

Rhynchostegium rusciforme (Weiss)
B. & S.

Schistidium gracile (Schleich.)
Limpr.

Schistidium alpicola rivulare (Brid.)
Wahlenb.

Sphagnum acutifolium Ang. var.
versicolor Warnst.

Sphagnum acutifolium gracile Röhl
forma *flagelliforme* Röhl subf.
viride Roell.

Sphagnum acutifolium gracile Röhl
forma *purpureum* Roell.

Sphagnum Girgensohnii graciles-
cens Grev.

Sphagnum Girgensohnii tenellum
Röhl forma *capitatum* Röhl subf.
ochraceo-virescens Roell.

Sphagnum Girgensohnii tenellum
Röhl forma *virescens* Roell.

Sphagnum medium imbricatum Roell
forma *roseum* Roell.

Sphagnum Schimperi deflexum Roell
subf. *virescens* Röhl.

Sphagnum Schimperi deflexum Roell
forma *viride* Roell.

Sphagnum squarrosum cuspidatum
Warnst. forma *pallido-virescens*
Roell.

Sphagnum squarrosum patulum
Roell forma *flavo-virens* Roell.

Sphagnum Wilsoni quinquefarium
Roell forma *patulum* Roell subf.
purpurascens Roell.

Sphagnum Wulfii squarrosulum
Russ. forma *viride* Roell.

Tetraplodon augustatus (L. f.) B.
& S.

THUIDIUM ABIETINUM HYSTRICOSUM
Mitt. (Husnot thinks this variety
does not differ from the species).

Trichostomum crispulum Br.

Tortella fragilis (Drumm.) Limpr.

TORTULA SUBINTERMEDIA (Ren. &
Card.) Card., nom. nov.

Ulota Americana Mitt.

" *crispula* Bruch.

Webera commutata Sch.

" *cruda minor* Sch.

" *elongata* (Dicks.) Schwaegr.)

" *nutans caespitosa* (H. & H.
Hueb.)

Webera nutans subdenticulata
(Brid.) Huebn. & Sch.

WEBERA NUTANS (Schreb.) Hedw.
forma *RETILAXIORE* Card. & Thér.

WEBERA NUTANS forma *INTERMEDIATE*
between var. *CAESPITOSA* and var
SUBDENTICULATA, fide Cardot.

*WEBERA PROLIGERA (Lindb.) Kindb.